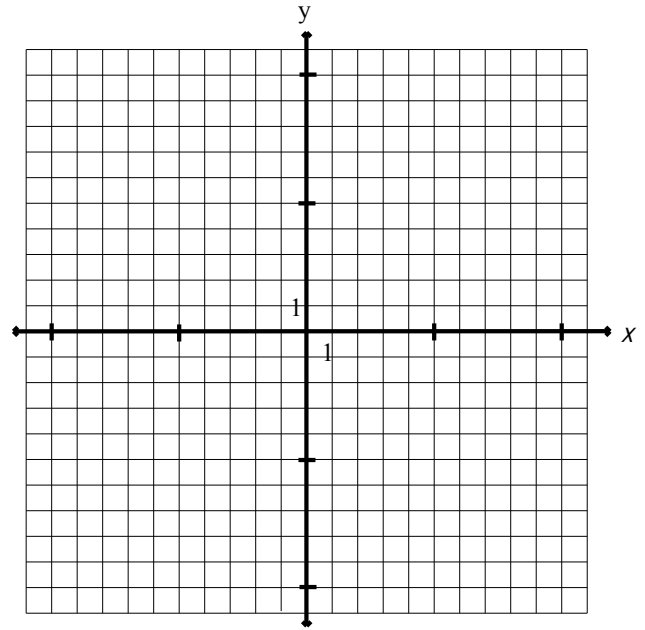


Solving Pairs of Linear Equations by Graphing

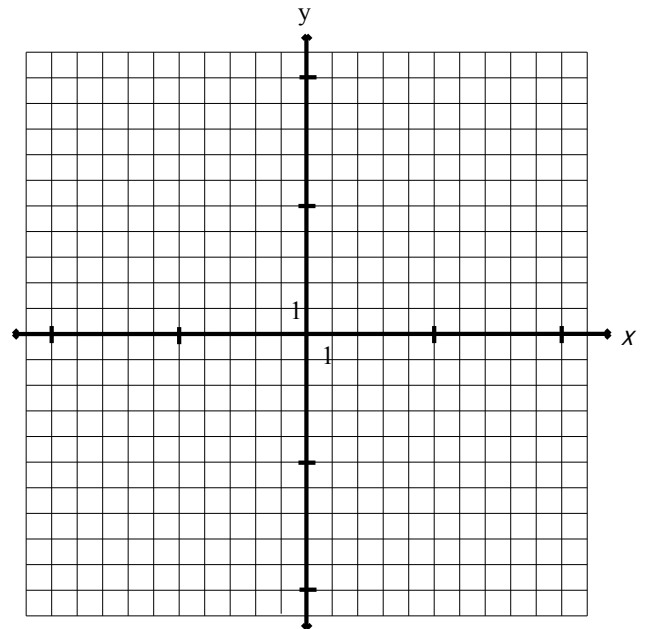
When solving a **system of linear relations**, the **point of intersection** of their graphs is the solution to that system of linear equations.

Ex. 1. Solve the following systems of linear equations graphically by determining the point of intersection, if possible.

a) $y = -\frac{3}{2}x + 4$
 $x - 2y - 8 = 0$

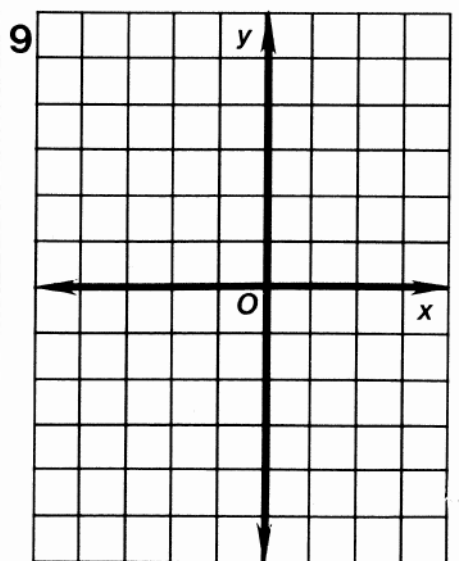
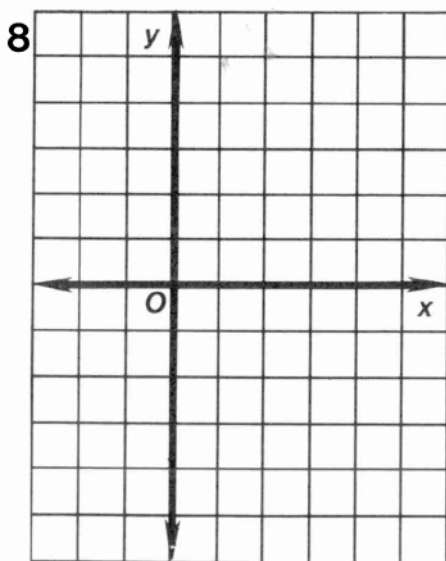
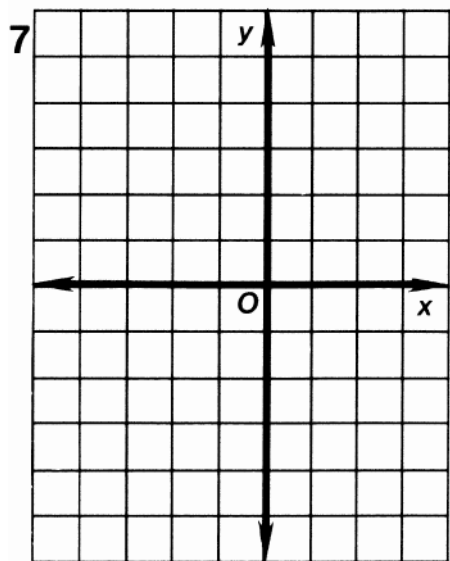
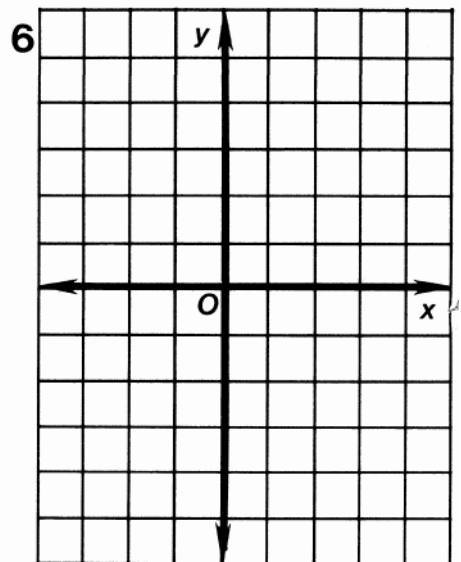
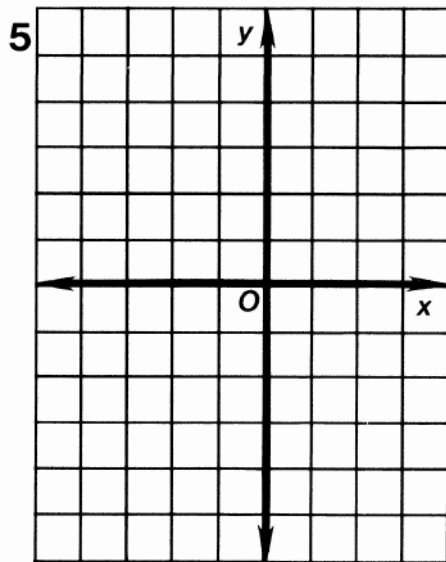
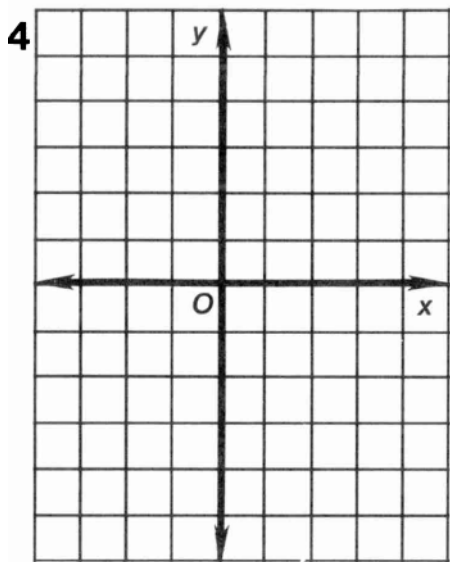
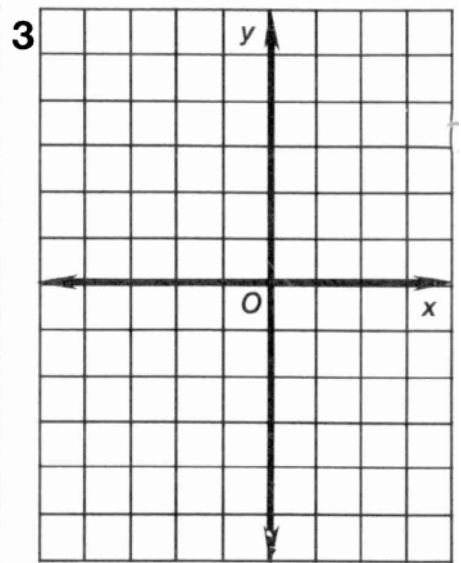
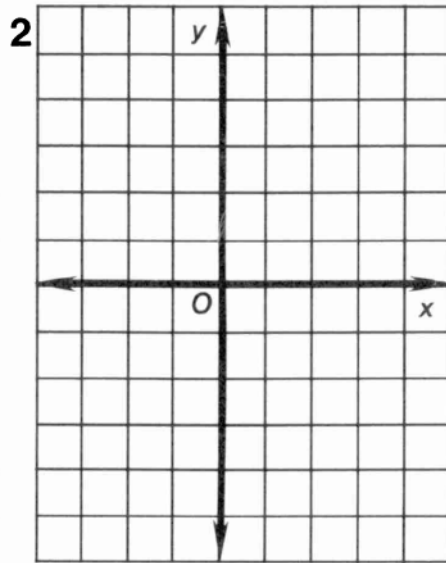
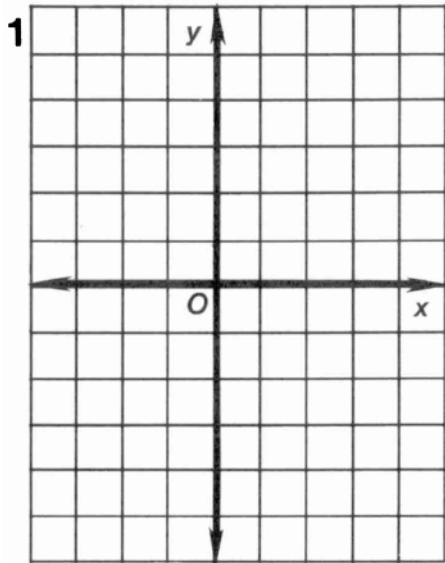


b) $y = 2x + 6$
 $4x - 2y = 0$



Ex. 1. Without graphing determine if the point $(-1, -3)$ is the solution to the following linear system:

$y = 4x + 1$
 $x - y = 5$



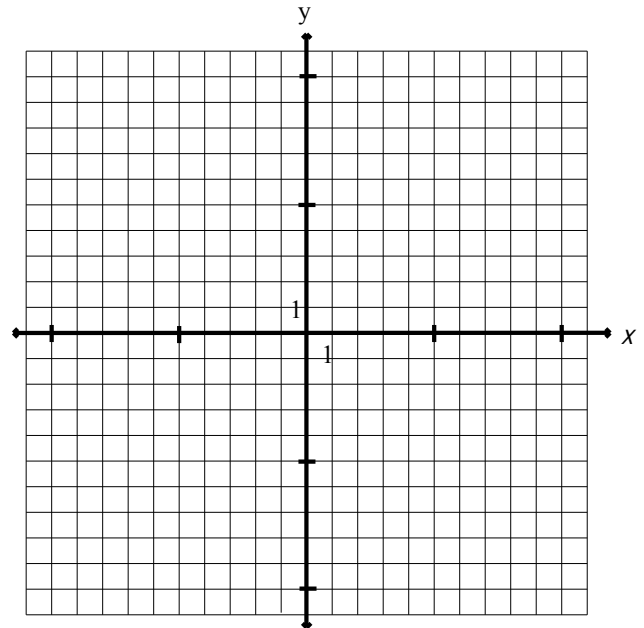
Solving Pairs of Linear Equations Algebraically

Recall:

When solving a **system of linear relations**, the **point of intersection** of their graphs is the solution to that system of linear equations.

Ex. 1. Solve the following system of linear equations **a) graphically** **b) algebraically**

a) $y = -2x + 8$
 $3x - 2y - 6 = 0$



b) $y = -2x + 8$
 $3x - 2y - 6 = 0$

Steps for Solving a Linear System of Equations Algebraically Using the Method of Comparison

1. Rewrite each equation in $y = mx + b$ (**slope, y-intercept**) form.
2. Compare the first equation to the second equation and then solve for x .
3. Substitute the x value found in step 2. into either equation in step 1. to find the y value.

Ex. 2. Solve the following systems of linear equations **algebraically** using **comparison**.

a) $2x - 3y = 12$
 $x = 4y + 1$

b) $x - y = 3$
 $6x + 4y = 13$

Equations in Slope, y -intercept Form for Linear Systems Worksheet #8

1. $y = 2x$

$y = -x + 12$

7. $y = \frac{2}{3}x + \frac{14}{3}$

$y = -\frac{1}{2}x + \frac{7}{2}$

2. $y = \frac{1}{3}x + \frac{1}{3}$

$y = -\frac{1}{2}x + \frac{9}{2}$

8. $y = 6x + 4$

$y = -x + \frac{15}{2}$

3. $y = 2x - 5$

$y = 4x - 7$

9. $y = -x + 1$

$y = 2x + 2$

4. $y = \frac{2}{3}x - 4$

$y = \frac{1}{4}x - \frac{1}{4}$

10. $y = \frac{5}{3}x + \frac{11}{3}$

$y = \frac{1}{2}x - 1$

5. $y = -x + 5$

$y = \frac{1}{4}x - \frac{5}{2}$

11. $y = x - 3$

$y = -\frac{3}{2}x + \frac{13}{4}$

6. $y = x - 2$

$y = \frac{4}{3}x - \frac{11}{3}$

12. $y = 2x - 16$

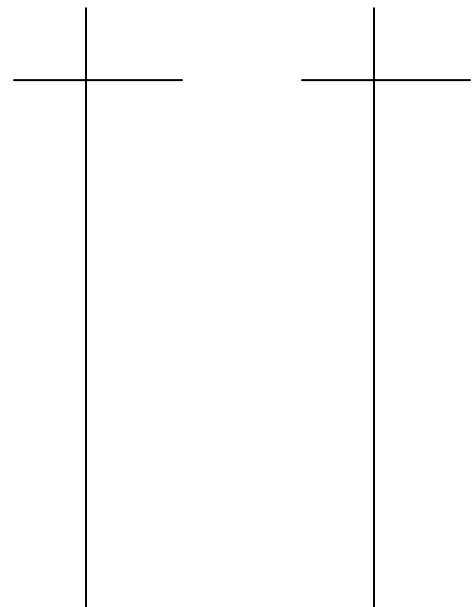
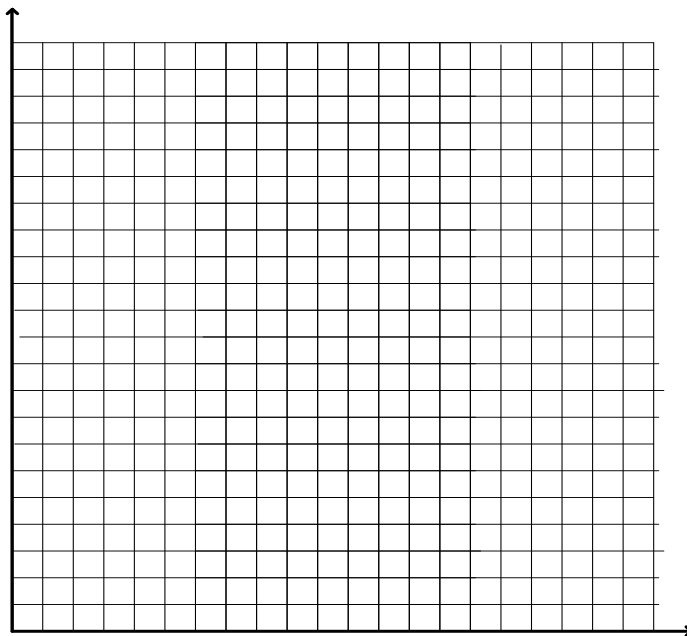
$y = \frac{1}{2}x - 4$

Graphing Applications Part I

Ex. 1. Two music websites provide the latest and the greatest songs from your favourite artists from Bieber to the Beatles. “Coldwire” charges an annual membership fee of \$20 per year plus 50¢ for each song downloaded. “Q-tunes” charges 75¢ /song with no membership fee.

a) Write an equation for each website. Include “let” statements”.

b) Graph both equations on the same set of axes, for up to 100 songs.



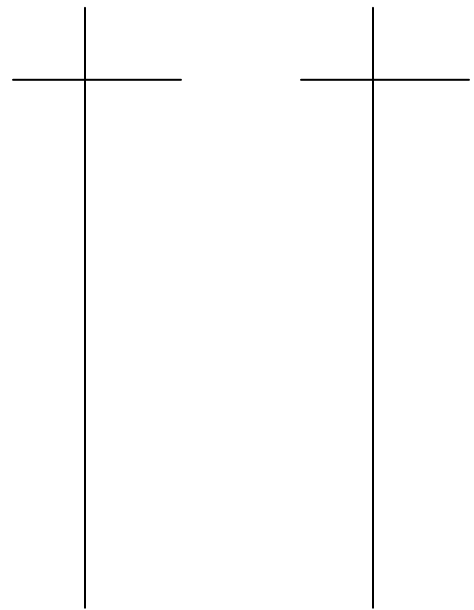
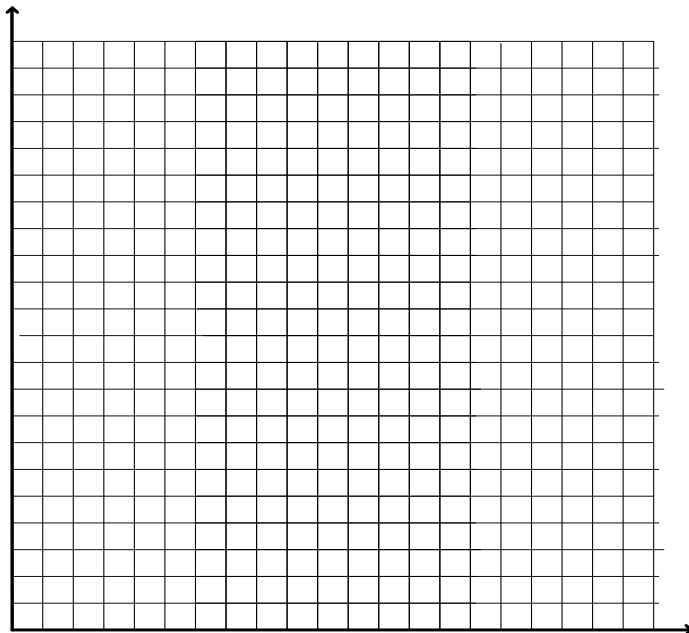
c) Determine the point of intersection. What does the point of intersection mean in this case?

d) What advice would you give to someone who is deciding which website to use?

Ex. 2. The cost to make ice pops is \$0.10 per ice pop, plus \$9.00 in supplies. Each ice pop sells for \$0.40.

a) Define the variables and then create a system of two linear equations to model this situation.

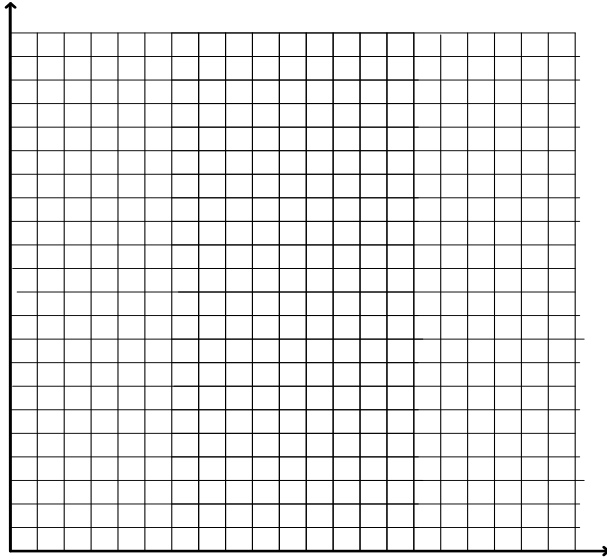
b) Graph both equations on the same set of axes, for up to 50 pops.



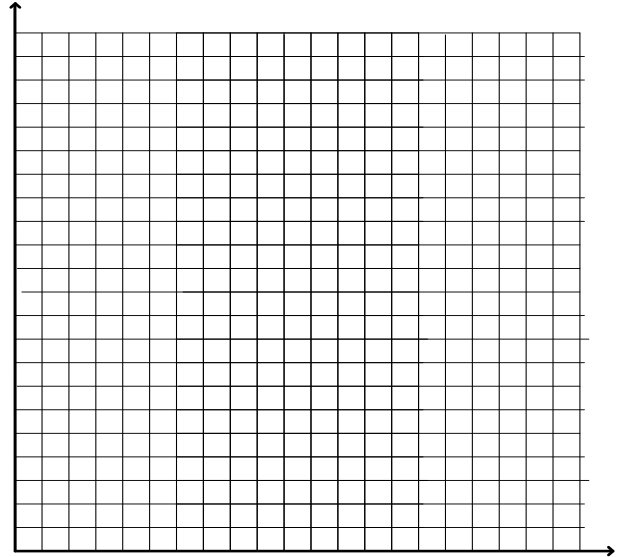
c) How many pops do you need to sell to break even?

Grids For Homework

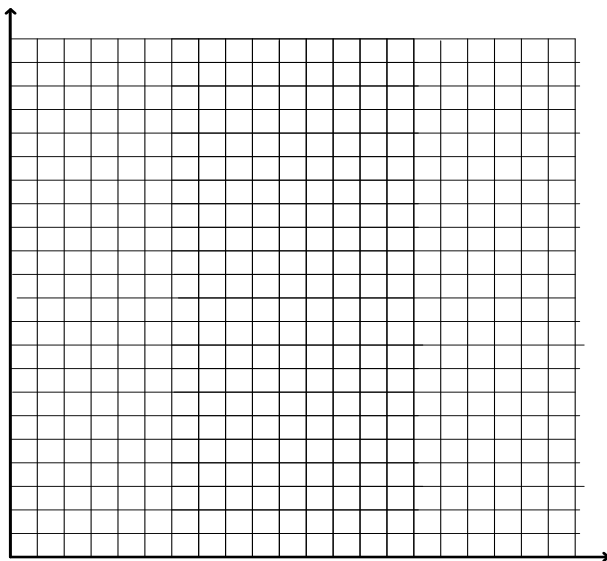
p. 245 #2



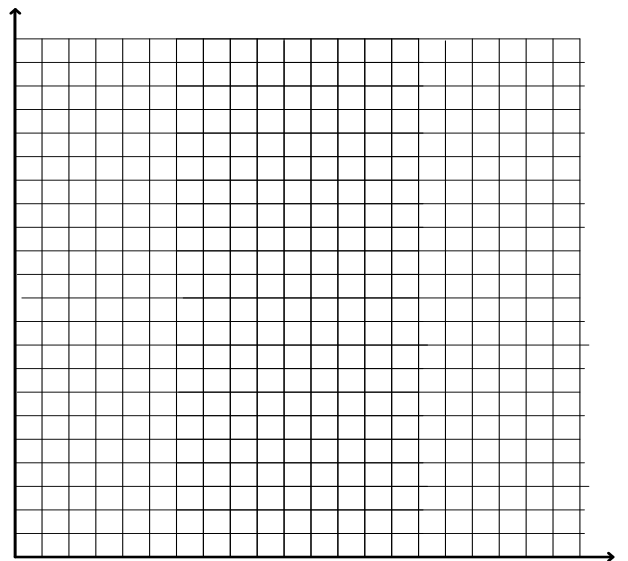
p. 251 #16



p. 246 #9



p. 251 #17

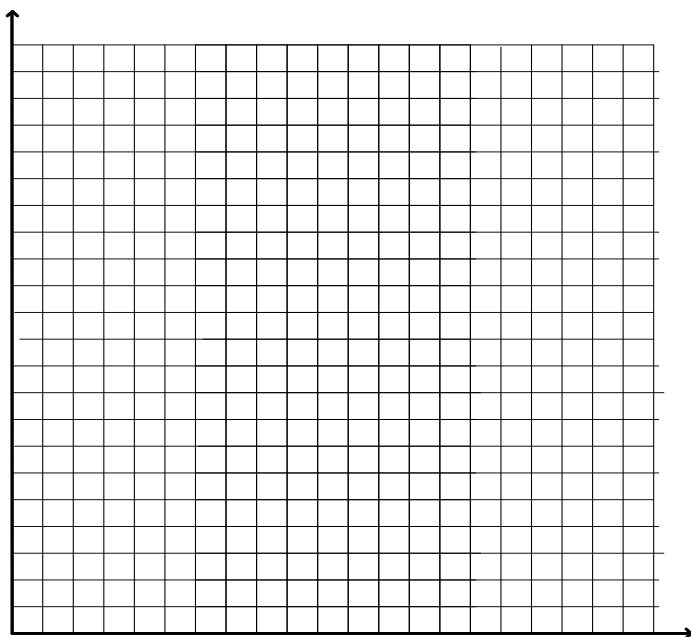


Graphing Applications Part II

Ex. 1. Joe has 26 coins that are all dimes and quarters. The value of the coins is \$4.10. How many dimes and how many quarters does Joe have?

a) Define the variables and write equations in terms of your variables for the total number of coins and the total value of the coins.

b) Graph both equations on the same set of axes using the **intercept method** for graphing.

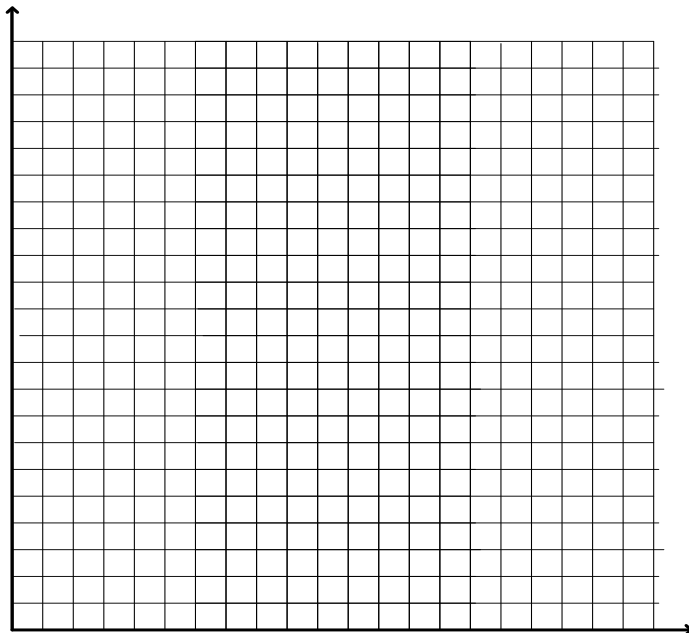


c) Determine the point of intersection. What does the point of intersection mean in this case?

Ex. 2. The **Cake Box** makes specialty cake pops and cupcakes. Each pop costs \$3 while each cupcake costs \$2. If 15 of these items were ordered at a cost of \$36 determine the number of pops and the number of cupcakes in the order.

a) Define the variables and write equations in terms of your variables for the total number of items in the order and the total cost.

b) Graph both equations on the same set of axes using the **intercept method** for graphing.



c) Determine the point of intersection. What does the point of intersection mean in this case?

Follow Ex. 2. for Extra Question below:

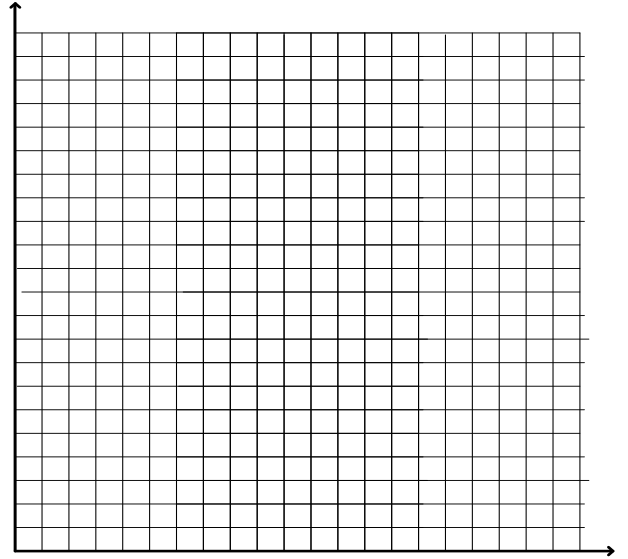
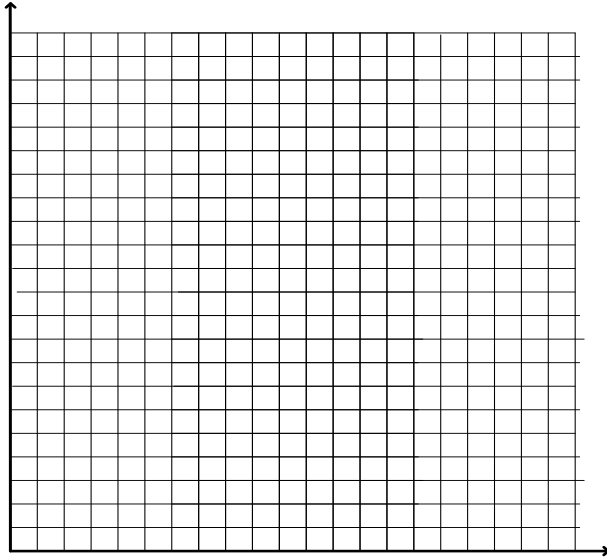
Tickets for this year's major drama production cost \$8 for adults and \$6 for students. Last night's performance raised \$2000 with 300 people in attendance. Determine how many of each type of ticket was sold, graphically. [Answer: (100, 200)]

HW: p. 246 #4, 5; p. 212 #18

Grids For Homework

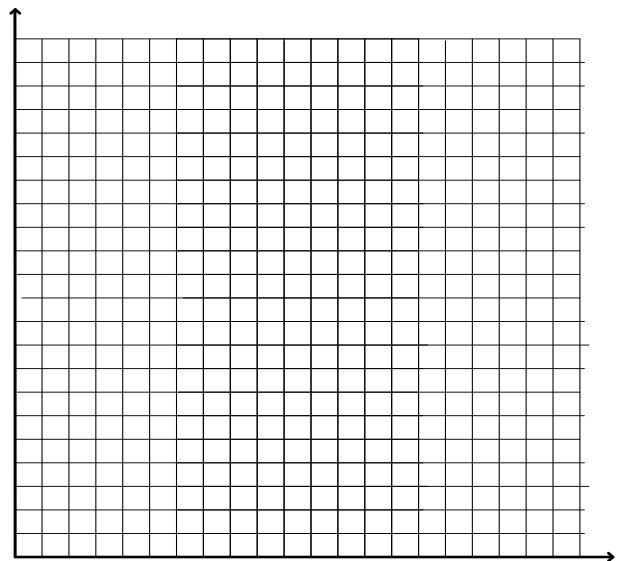
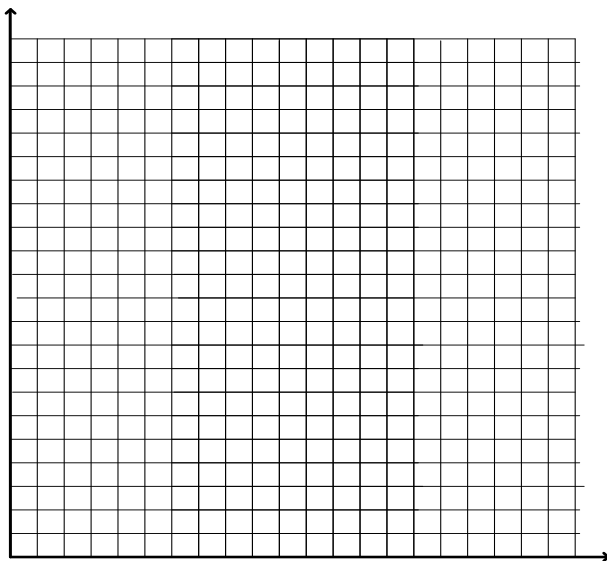
Extra Question

p. 246 #4



p. 246 #5

p. 212 #18



Unit 6B Review Assignment

1. Rearrange each of the following to $y = mx + b$ form and state the **slope** and **y-intercept** of each line.

a) $\frac{2}{3}x + \frac{1}{2}y = 1$

slope =

y-intercept =

b) $x - 2y + 12 = 0$

slope =

y-intercept =

2. **Solve** the following linear system **by comparison** to determine the exact point of intersection.

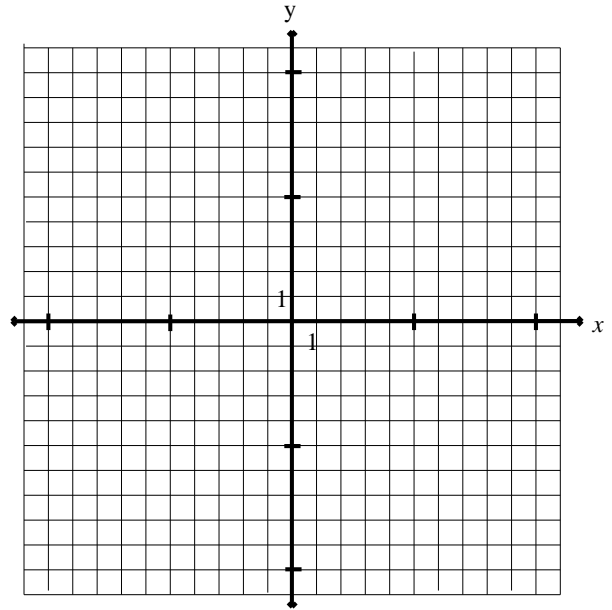
$$y = -\frac{4}{3}x + 2$$

$$y = \frac{1}{2}x + 6$$

3. Graph:

a) $y = \frac{1}{3}x - 6$ using the **slope, y-intercept method**.

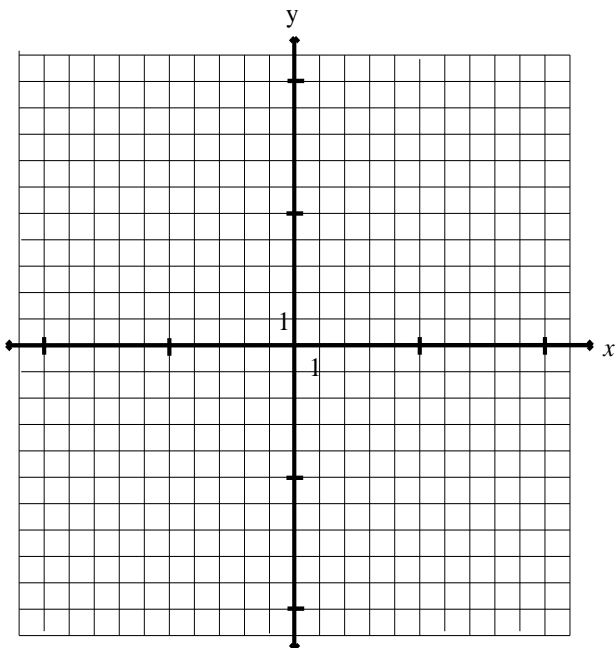
b) $4x - 3y + 12 = 0$ using the **intercept method**.



4. **Solve** the following linear system **graphically** to determine the exact point of intersection.

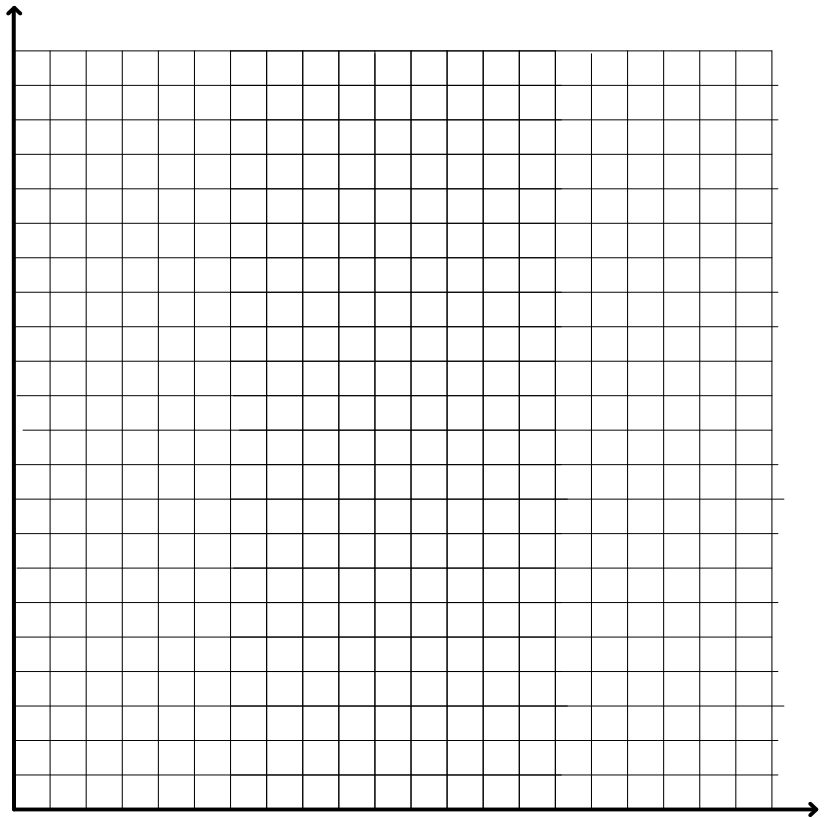
$$2x + y = 0$$

$$4x - 2y + 8 = 0$$



5. Mrs. Cort finds a change purse. She counts out 70 coins, all nickels and dimes. The total value of the coins is \$5.00. Mrs. Cort tells Lukas he can have all the money if he can determine how many of each coin there is using the information above.
- a) Define the variables and write equations in terms of your variables for the total number of coins and the total value of the coins.

- b) Graph both equations on the same set of axes using the **intercept method** for graphing.



- c) State the point of intersection. What information should Lukas get from the intersection point?

HW: REVIEW FOR UNIT 6 TEST

p. 246 #8ac* (solve graphically) – Lesson 7

p. 252 #5 (solve by comparison) – Lesson 8

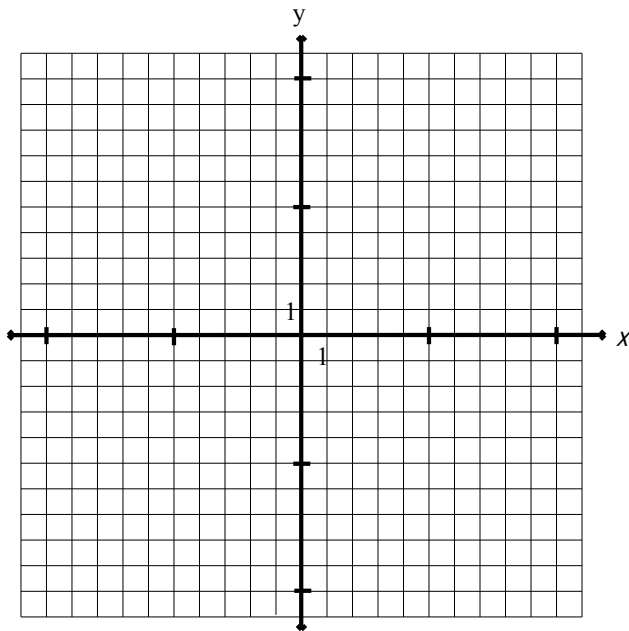
p. 252 #6 (solve by comparison) – Lesson 9 Ex. 2 for linear system set up and Lesson 8

p. 258 #10* – Lesson 9 Ex. 1.

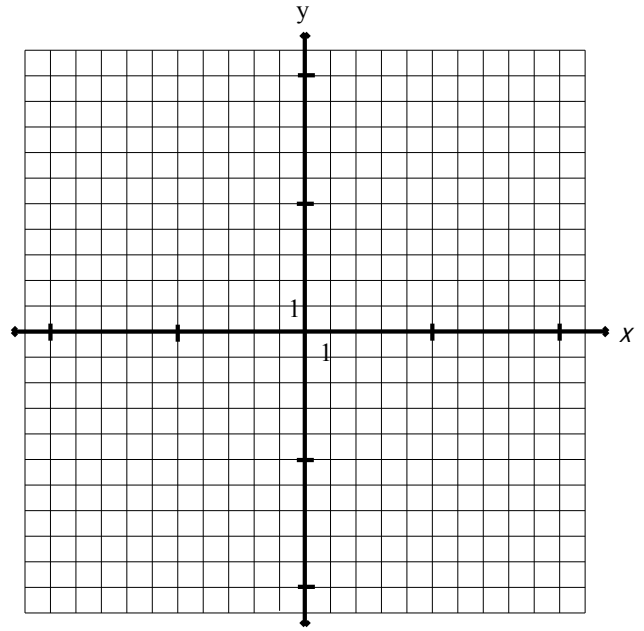
p. 270 #9* – Lesson 10 Ex. 1.

*grids provided

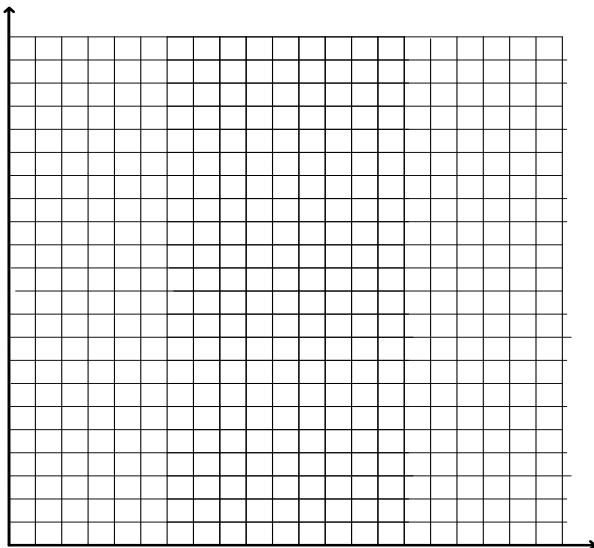
p. 246 #8. a)



p. 246 #8. c)



p. 258 #10



p. 270 #9

